

Coal Price Impact on Coal Supply and Demand

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Abstract

This paper reviews the impact of coal price movements on the supply and demand of export coal into the Asian metallurgical and thermal coal markets. A review of price, supply and demand movements over the last 5 years have been used to assess the correlation between these variables. Prices have fallen steadily over the last 5 years although demand has increased steadily. The main reason for price decline was the rapid increase in export capacity in countries like Australia, Indonesia, P.R.China and South Africa, which exceeded the build up in demand. The increase in demand has been partially offset by a reduction in domestic demand in Indonesia, which has forced some domestic supply into the export market.

Although prices have fallen steadily this has been matched by falling costs in key exporting economies like Australia, Canada and South Africa. The cost reductions have been as a result of productivity improvements, reduction in government charges and rail and port costs, company rationalizations and company consolidation through acquisition and mergers. These cost reductions have generally matched falling prices but due to the duration of the period over which the declines have occurred companies have experienced a lack of confidence in developing future large-scale greenfield projects. This situation is compounded by the build up of latent capacity that has resulted from increased capital and equipment utilization that will satisfy any forecast increase in demand growth in the near term.

Asian Coal Demand

In the mid 1990s Asian coal demand was expected to grow steadily with the introduction of Independent Power Stations including those in Indonesia and Thailand. As a result of the Asian economic crisis between 1997 and 1998 the IPP programs in Thailand faced delays of approximately one year while the Indonesian IPPs faced even longer delays. The delays in Thailand have not impacted significantly on long-term demand forecasts. However the delays in Indonesia are more critical on domestic Indonesian coal producers.

Supply to the Indonesian IPPs was expected from new greenfield mine developments in Indonesia. When the power stations were delayed the mines like PT Adaro had to redirect up to 5 Mtpa of production into the export market. Others mines have been forced to cut back on short term expansion plans. The net result has not been significant in overall Asian terms, as the Indonesian mines have also been forced to limit expansion plans due to financial constraints as domestic prices have fallen.

Excluding these two member economies the remaining Asian importers like Japan, Republic of Korea, Chinese Taipei and Hong Kong, China have not experienced major changes in coal demand over the last 5 years. As coal has been a low cost fuel source demand has been relatively unaffected over the period from 1997 to 1998 (as can be seen from the following table on "Imports by exporting economy"). Imports for these economies have increased from 207.4 Mt in 1995 to

231.2 Mt in 1998. A small decrease occurred in 1998 but demand is now expected to steadily increase again in 1999 and 2000.

The small drop in demand in 1998 does not explain the price decline from 1995 to 1999 and further expected price decline in 2000. The main reason for this decline is the rapid increase in production capacity with greenfield developments and brownfield expansions over this period in Australia, P.R.China, Indonesia and South Africa.

Coal Price Movements

Over the past 5 years export metallurgical and thermal coal prices have continued to decline. The rate of decline varied by sector, as spot prices have not fallen as dramatically as benchmark prices. Total revenue has also been affected by the increased percentage of tender sales, decreased spot sales and increased discounted benchmark sales. To better understand the net effect on received prices to the supplier the average FOB export value by coal type produced by the Australian Bureau of Statistics has been used as an overall measure of change for the Australian producers. There will be some differences per member economy for example the Canadian suppliers will have a higher percentage of benchmark pricing and the Indonesian suppliers will have a higher percentage of spot pricing.

The fall in benchmark price has been more dramatic over the last 4 years after rollover from 1995 to 1996. Spot prices FOB Newcastle have been more volatile with a jump during 1995 from US\$29.50 to US\$37.50 and then steadily falling to a low of US\$22.00 in 1998 before stabilizing in a range from US\$21 to US\$23.00 by the end of 1999. The following table shows the movement in benchmark, spot and average export FOB values for Australian thermal and metallurgical coal.

As can be seen from Table 1, there has been a steady decrease in all prices and segments over the last 5 years. Looking back further in history prices have remained in a similar range as that above and in January 1986 the benchmark price was US\$33.50, which is higher than the benchmark price in JFY1999. The benchmark price is expected to fall further in JFY 2000. These long-term trends show that prices have not only been falling in real terms but also in nominal terms over a very long period as per most commodities.

Response by Coal Suppliers

Although prices have fallen steadily over the last 5 years export coal sales have continued to increase from member economies including Australia, Indonesia and P.R.China with the exception of Canada, South Africa and US, which have lost market, share (Table 2).

The total change in imports to Asean member economies (P.R.China, Hong Kong, China, Japan, Republic of Korea, Chinese Taipei) by major exporter is shown in Table 2.

There have been few mine closures, however, to survive in a climate of diminishing prices mining companies have rationalized onsite operations, increased productivity and restructured corporate services. They have also been more flexible in establishing strategic joint ventures with neighbouring leaseholders to improve extraction efficiencies and optimize reserves and infrastructure.

Governments have responded by reducing port and rail costs and in some cases increasing export rebates or eliminating hidden royalties. Rail freight reduction have occurred in Australia, Canada and South Africa while reduced hidden royalties or increased tax rebates have been offered by Australian and Chinese governments.

Rail and port infrastructure in Australia and South Africa is now mature. Although there have been few new greenfield projects in the last few years several new low capital cost start ups with

contractor support have taken advantage of proximity to rail or ports or towns to increase total production capacity. Brownfield expansions have been more common with a doubling of capacity in some cases with an incremental capital outlay compared to initial project development.

Currency devaluations have also assisted in reducing the impact of falling US dollar prices on Australian, Canadian, Indonesian and South African producers. The Indonesian producers however, have had cost exposure mostly in US dollars and therefore have not benefited as much as Australia, Canada and South Africa. Producers in US have had negative impacts on coal supply to Asia due to competitive pressure from currency devaluations in other export economies (Table 3). for currency movements by the competing member economies.

The net result is a reduction in FOB costs which have matched or exceeded in some cases the reduction in export prices. These issues will be discussed below.

Mine Closures

Mine closures have been minor with a limited number experienced over the last 5 years purely as a result of low export prices. Mines included in this category in Australia, Canada, and South Africa represent capacity of less than 6 million tonnes over the 5-year period. In US several mines on the West Coast have either closed or redirected sales into the domestic market.

In many cases mines have closed and have been reopened by entrants acquiring the assets at a fraction of their original book value. Mines in this category in Australia are Brimstone, Clarence, Cook, Ellaong/Southland, Gretley/New Wallsend, Metropolitan, and Tahmoor. In Canada these mines include Elkview and Smoky River. Although these mines have opened at lower production rates constrained mostly by lack of higher priced contracts they are still producing tonnage and capacity is available if market demand and prices increase.

Company Rationalization

Most of the major coal exporters have significantly rationalized their operations over the last 5-year period. These include Rio Tinto, BHP, Mt Isa Mines, Shell, Billiton, Fording, Tek, Luscar, Peabody and Cyprus. The rationalizations have included dramatic change to on site work practices with the introduction of enterprise agreements, the use of multiskilling and work place redesign, head office rationalization and the increasing use of contractors and consultants to outsource non-key components of the work place.

An example of the increase in productivity is Anglo Coal from South Africa which has increased turnover per employee by 12%, the cost of sales have increased by 14.7%, while profit per employee has increased by 8.2%. An Australian example is the BHP Central Queensland and South Coast mines that have reduced total labour numbers by up to 40% in the last two years. The improvement figures vary by company and member economy however, the net result of a total reduction of FOB costs is between 15% in US dollar terms for some South African mines and 35% in US\$ for some Australian mines. As can be seen above these savings have helped to offset the reductions in price for benchmark price of 25.7% in US dollar terms over the same period.

Several new Indonesian producers have not only changed structure but due to high debt levels have had to relinquish mine leases and assets to project bankers. These include PT Berau, PT Indominco Mandiri, and PT Bukit Baiduri. However, the mines have not ceased production and operate under administration until they can be sold to a new owner at a reduced capital value that reflects current pricing and reduced demand. It is important to note that the above Indonesian mines have not only been hampered by poor export pricing but have also suffered an additional penalty with the collapse of the IPP program and deferment of rapid growth in the domestic coal market.

Rail Freight/Government Charges

The governments of the exporting economies have also assisted in reducing export costs. In P.R.China this has occurred through the increase of a tax rebate from 9% to 13%, which offsets the company value added tax of 13%. The Chinese government has also upgraded rail and port capacity by eliminating bottlenecks, increasing electrification and the number of tracks on major rail corridors, and sponsored port expansions and new rail routes from the Shenmu and Shanxi coal fields.

In Australia the Queensland and NSW governments have reduced costs and increased competition by allowing private rail operators. They have also reduced hidden royalties and rail access charges. Costs in NSW have reduced by over 20% on most lines and to most mines over the review period. In Queensland costs have reduced by up to 60% for some Central Bowen Basins operators due to a change in hidden royalty payments.

In South Africa Railink has reduced costs to RBCT from an average of US\$7.97 in 1995/96 to US\$5.29 in 1999/2000 a total reduction of 33.6% through increased productivity, improved capital utilization and reduction in bottlenecks.

In Canada rail freights for metallurgical coal in particular have fallen from approximately C\$18 to C\$14. This is a result of the rail carriers trying to maintain rail throughput by supporting the coal producers. Thermal coal has also benefited by rail freight reductions but not to the same extent as metallurgical coal.

Most of these changes have been possible due to increased throughput, new technology, labour rationalization, improved capital utilization and increased private competition of both rail and port facilities. Although unit revenues have fallen total revenue has increased due to the additional tonnage and throughput.

Brownfield Expansions/Greenfield Development

There have been very few greenfield development projects over the last 5 years and a number of potential projects are now in abeyance until the current market oversupply is in better balance. The bulk of new projects have been developed in Australia and Indonesia and these two economies have had the largest share of increased exports to Asia over the last 5 years. A number of new projects that were developed were based on decision making from 1992 to 1995 when coal prices were slowly rising. Under the current low price regime it is unlikely that some of the larger capital-intensive projects would have been approved.

In Australia the new greenfields projects include

- Bengalla open cut mine in NSW;
- Mt Owen open cut mine in NSW;
- Oaky Creek North underground mine in Queensland;
- Newlands underground mine in Queensland;
- Crinum underground mine in Queensland;
- South Walker Creek open cut mine in Queensland;
- Coppabella open cut mine in Queensland.

The latter two mines are typical of the new style of low capital entrants, which are able to utilize existing mature infrastructure in the form of rail and port facilities. There are expected to be several more of the low capital cost entrants that no longer need to build towns, extensive rail links or port facilities to establish production facilities. These mines will make it difficult for major capital expenditure projects as they have opened up options for new entrants, which more easily

achieve a return on investment in a low price environment.

In South Africa the only new greenfields projects were TESA's Forzando and Dorstfontein collieries. The remaining increases in capacity have been brownfield expansions.

P.R.China has been very active in development of major new greenfields coal projects. Some of these projects have also received the support of Japanese Energy Loans. A number of these projects will have new capacity targeting the growing domestic market with the new power stations being built along the Southern Coastline but also the export market to Japan, Republic of Korea and Chinese Taipei. The projects currently being developed included:

The large Shenhua project in the Shenmu/Domngsheng coalfield with associated rail, port and shipping infrastructure.

Jining No2 and Jining No3 underground coal mines being developed by the Yanzhou Coal Mining Group.

Anjialing open cut mine being developed by the Pingshou Mining Administration.

Chensilou and Cheji underground mines being developed by the Yongxia Coal Mining Administration.

Fucuan underground coalmine being developed by the Zhaozhuang Coal Mining Bureau.

Brown fields expansions have occurred at a number of bureau including Daizhuang and Xuchang underground coalmines in the Zibo Coal Mining Bureau in the Shandong province.

In Indonesia a number of new projects have been developed over the last 5 years. These include a number of mines all on the island of Kalimantan:

- PT Indominco Manidiri
- PT Berau
- Pt Sebuk
- PT Bentala
- PT Kendilo
- PT Gunung Bayan Pratama

Most of these mines were developed to underpin rapid export and domestic market growth forecast from 1998 to 2005. However, due to the Asian economic crisis, which has had a negative impact on domestic demand in Indonesia and falling export prices, these mines have been left with high levels of US dollar debt that cannot be serviced by the low income streams currently experienced in the market. These mines are now in the hands of administrators or the mining titles and assets have been returned to the project banks. The mines should continue to operate but rapid expansion plans will be curtailed and the mines will need new owners to refinance debt before further expansion of capacity can take place.

Mergers/Acquisitions

Mergers and acquisitions have been a feature of the supply structure in the last 3 years. Acquisitions in particular have continued on a global scale with companies like Rio Tinto, Glencore, Billiton, Anglo Coal, and RAG of Germany. This activity has mostly been concentrated in Australia, South Africa and Canada while the operations in Indonesia have remained with the original companies or project banks.

At present a large number of mines are up for sale in Australia, which includes the Shell Coal group of companies, the North Goonyella mine, the Cyprus Coal assets and the remaining ARCO Coal assets. The same key players as listed above are expected to be interested in these assets, which will further establish their positions in the Asian coal industry.

The advantage of a strategic acquisition or merger is that it provides the opportunity to further

reduce mining costs or increase revenues by capitalizing on synergies of assets, infrastructure and marketing power. A good example of this is the merger of the Coal & Allied and Novacoal assets in the Hunter Valley. The two mines in the new Coal & Allied structure that have benefited with lower costs of up to 25% in the last 12 months are Hunter Valley No1 and Howick mines which have adjoining lease boundaries. These mines now have only one mine management; one technical services group and share maintenance facilities and mining equipment across the combined lease. This combined with the opportunity to rationalize on site labour has resulted in significant and sustainable cost reductions for the combined new mine, which is Hunter Valley Northern Operations. Rio Tinto also acquired the Kestrel hard coking coal mine in Queensland from ARCO. This now allows Rio Tinto to have a strong supply presence in the metallurgical and thermal coal markets with supply alternatives from NSW and Queensland. This presents a number of options for buyers of Rio Tinto products and further established the company as a key coal supplier to Asia.

Other changes include the acquisition by Billiton of the Coal Operations of Australian, which makes Billiton the largest thermal coal producer in the Asean region. Billiton is continuing to investigate other opportunities that combine synergies with their existing assets. Consolidation of the Canadian coal exporters has also occurred over the last 5 years with a reduction from 6 to 3 companies. This has provided the Canadian suppliers with increased market flexibility to supply from several sources and coal types.

Change to Existing Mine Production/Capacity

Some coal exporters in Australia, Canada, Indonesia and US have chosen to limit production to service higher priced contracts and reduce additional tonnage that may have been sold into spot markets. These mines have considerable latent capacity that has been increased by improvements in capital and infrastructure utilization but has not been committed to production. It is hard to estimate the total latent capacity currently available but it could easily be in excess of 30 Mtpa that would require no additional capital but some changes in rosters and production schedules to shift to 7-day operations or in some cases from 3 to 5 day operations. This latent capacity will meet current demand and expected short term increases from Asean economies.

A combination of this latent capacity and low prices will limit expenditure on major greenfields projects over the next 3 year period. Although suppliers have managed to curtail costs as prices have fallen it has however dented confidence in new investments and reduced any reasonable returns on capital expenditure. The major mining projects currently on hold are:

- Kayuga, Maules Creek, Wyong and Glendell in NSW;
- Togara North and Hail Creek in Queensland;
- Cheviot, Willow Creek, Telkwa, Tsable River in Canada;
- Expansions at PT Kaltim Prima, PT Kideco, PT Berau and PT Indominco;
- Mandiri.

It is important to note that South African market share has fallen to Asia, however this is not a function of reducing capacity but of increasing coal sales to Europe and India. The South African interest in coal sales to Asia is dependent on access to better-priced markets to Europe and India. In late 1999 the South African producers were looking to increase sales to the Asian markets due to increased competition in the European market from Russian, Colombian and Venezuelan supply.

Producers in US are also swing suppliers to Asia but have been squeezed out of the market due to currency movements and increased productivity from other supply economies. It is not attractive to supply coal from the West Coast markets, mostly due to transport costs. Mines supplying into this market have either reentered the domestic coal market or placed mines on care

and maintenance until export revenues become more attractive. These producers in US must be considered as an upside boundary on prices as they will quickly reenter the market if thermal coal prices increase to a point that makes exports more profitable. At this point a significant tonnage of exports will become available and would have the immediate effect of capping price.

Conclusion

Export coal prices have fallen steadily in real and nominal terms for the past 4 years. The price reductions have not been driven by steadily decreasing demand but by oversupply from key producers in Australia, P.R.China, Indonesia and South Africa. These price reductions have had an ongoing impact on the structure and efficiency of key export Asian coal suppliers. However, it has not impacted overall coal supply capacity, which has been rising steadily despite the fall in prices. Due to a number of structural changes within the seaborne coal industry economies like Australia and Indonesia have increased market share to Asia while other countries like Canada, South Africa and US have had falling market share. The changes in market share between the supplying economies have been driven by issues like:

- Development of new greenfields coalfields and expectation of increasing domestic demand as the case of Indonesia;
- Currency devaluation in Australia, Canada, Indonesia, and South Africa;
- Differential productivity improvements between competing economies;
- Improved capital utilization through workplace and corporate restructuring;
- Industry mergers and acquisitions, which have accessed synergies between assets, infrastructure and markets.

The net result of these changes has been significant FOB cost reductions. These cost reductions have kept pace with falling prices and although they have not increased margins they have at least maintained operating conditions for mines in Australia, Canada and South Africa. Some Indonesian mines, due to US dollar financing and highly geared projects, have experienced very difficult operating conditions. These companies have subsequently gone into administration or handed over mining leases and assets to project bankers. However in these cases all mines have continued to operate at or near name plate capacity and will do so until new companies can be found to inject new capital for further capacity expansion.

One negative impact of falling prices for such a long period is that there is little confidence in investment in new greenfields projects. This has resulted from the restructuring and productivity improvements of existing mines with latent capacity available if the market improves. Some of the constraints to new project development have been offset by low capital cost entrants who are able to utilize the mature rail and port infrastructure and experience of established mining contractors.

Overall it is apparent that falling coal prices have not negatively impacted on coal supply capacity into the Asean region. There may be some longer-term negative impacts on production capacity if prices continue to fall as is now expected in JFY 2000. However, this may be offset by a more positive movement in the spot price end of the market as benchmark or ceiling prices continue to fall.

The major impact of falling prices has been on continually driving efficiency in the supply side of the export coal sector, which has been to the benefit of the coal buyers in Asia. Some economies have been able to respond favourably with efficiency changes and reduce costs; others like US have been adversely affected and have lost significant market share. The total latent capacity of existing mines is available for increasing demand in the short term. Over the longer term however, an increase in export price will be necessary to justify commencement of the major

greenfields developments needed to match growth beyond the next 5 year supply window.

References

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Table 1. Benchmark, Spot and Average Australian FOB Value Movements

Price Segment	Unit	1995	1996	1997	1998	1999	Total Change (%)
Japanese Benchmark *JFY	US\$	40.30	40.30	37.65	34.50	29.95	-25.7
Spot price ex Newcastle (as at June of each year)	US\$	37.50	36.00	30.00	23.00	23.5	-37.3
Ave export FOB prices for Australian thermal coal to Asia	US\$	35.70	38.38	34.57	31.26	27.16	-23.9
Ave export FOB prices for Australian thermal coal to Asia	A\$	48.28	48.94	46.94	49.61	42.10	-12.8
Ave export FOB prices for Australian hard coking coal to Asia	US\$	47.47	51.07	50.75	47.70	38.25	-19.4
Ave export FOB prices for Australian hard coking coal to Asia	A\$	64.21	65.09	68.99	75.77	59.29	-7.7

*JFY Prices quoted are for Japanese Financial Year

Table 2. Imports by exporting country (Mtpa)

	1995	1996	1997	1998
Australia	96.2	100.8	114.1	116.4
Canada	32.0	33.0	36.0	34.0
P.R.China	24.7	26.7	27.7	27.9
Indonesia	19.5	21.3	25.4	30.8
South Africa*	20.7	18.7	17.1	12.9
US	14.4	15.2	12.5	9.2
Total	207.4	215.7	232.8	231.2

Note: *The drop in South African share to Asia is partly offset by increased sales to more attractive markets in Europe and India.

Table 3. Currency Movements for Asian Coal Suppliers

	Unit	1995	1996	1997	1998	1999	Annual Change (%)
Australia	A\$1.00=US\$	.7415	.7829	.7441	.6294	.6464	-2.71
Canada	C\$1.00=US\$	.7288	.7335	.7224	.6748	.6718	-1.62
Indonesia	US\$1.00=RP	2249	2342	2929	10014	8003	-22.42
South Africa	R1.00=US\$	.2757	.2342	.2172	.1824	.1639	-9.88